

Figure 1

CDR3

(39)

VS GGSINSGDYYXWSWIRHPRKGLDCIGYVYSGSTYYNPSLKSRYTISVDISKNOFLKLI<sup>32</sup>TSYTAADI<sup>33</sup>AVYYCARSTVYNPGWEDPWGQGTLYTSS (SEQ ID NO: 1)

CDR1

CDR2

Figure 2

(3)

GTCTCTGGTGG GCTCCATCA CAGTGGTGAT TACTACTGGA GCTGGATCCG CCAGCACCCA GGGAAAGGCC TGGACTGCAT TGGGTACATC TATTACAGTG GGAGCACCTA  
CTACAAACCCG TCCCTCAAGA GTCGAGTTAC CATATCAAGTA GACACGTCTA AGAATCAGTT CTTCCTGAAG CTGACCTCTG TGACTGCCGC GGACACGGCC GTGTATTACT  
GTGCGAGATC TACGGTGGTA AATCCGGGGT GGTTGACCC CTGGGGCCAR GGAACCTTGG TCACCGTCTC CTCA (SEQ ID NO: 2)

Figure 3

CDR3

(SEQ ID NO: 3)

(40)

CDR1

CDR2

Figure 4

TTTCQASODINNYLNWFQOKPKAPKYL<sup>35</sup>HDASNLHETGSPSRFSGSGSDIDETETISGL<sup>36</sup>OPEDLATYYCOOYESL<sup>37</sup>PLTFGGGTV<sup>38</sup>VEKRTVAAPSVFI<sup>39</sup>PPSD<sup>40</sup>EQ  
ACCATCACTT GCCAGGCGAG TCAGGACATT AACACTATT TAAATTGGT TCAGCAGAAA CCAGGAAAG CCCCT AAGGTCTGA TCACGATGC ATCCAATTG  
GAAACAGGGG GCCCATCAAG GTTCAGTGA AGTGATCTG GGACA GATTTACT TCACCATCAG CGGCTTGCAG CCTGAAGACA TTGCAACATA TTATTGTCAA  
CAGTATGAAA GTCTC CCACTCATT TCGGCGGAG GACCAAGTG GAGATCAAA (SEQ ID NO: 4)

(5)

(4)

**Figure 5**

VSQGSINSGDYYWSWIRHPRKGLHWIGSIYYSGNITFYNPSISKRYTISLDTSKNOESLKLSVTAADTAVCYCARNITTCADFDWGGGTMTVSS (SEQ ID NO: 7) 25  
CDR1 CDR2 CDR3 41

**Figure 6**

GTCCTGGTGGCTCCATCAA CAGTGGTGAT TACTACTGGA GCTGGATCCG CCAGCACCCA GGAAGGGCC TGGAGTGAT TGGTCCATC TATTACAGTG GGAACACCTT  
CTACAACCCG TCCCTCAAGA GTCGAGTTAC GATATCACTA GACACGCTTA AGAACAGATT CTCCTGAAG CTGAGTTCTG TGAATGCCGC GGACACGGCC GTGTGTACT  
GTGGAGAAA TATAGTACT ACGGGTGCTT TTGATATCTG GGGCCAAAGG ACAATGGTCA CCGTCTTCA A (SEQ ID NO: 8) 5

**Figure 7**

TTCQASODITLYANWYOOKRPGKAPKLLNDASSLEFGVPLRFSGSGSDTFHTISSLOREDIATVYCGOYDHLPLTGGGTVVAIKRTVAAPSVFRRPSDEQ (SEQ ID NO: 9) 29  
CDR1 CDR2 CDR3 42

**Figure 8**

ACCATCACTT GTCAGGCGAG TCAGGACATT ACCATTATT TAAATTGTA TCAACAGAAA CCAGGAAAG CCCCT AAGTCTCTGA TCAACGACGC ATCCAGTTTG  
GAAACAGGGG TCCCATTAAG GTTCAGTGA AGTGATCTG GGACA GATTTTACTT TCACCATCAG CAGCTGCGAG CTTGAAGATA TTGCAACATA TTACTGTCAA  
CAGTATGATC ATCTC CCGTCACTT TCGGCGGCGG GACCAAGGTG GCGATCAAA (SEQ ID NO: 10) 6

**Figure 9**

VSGSISG Dxyxw LwroHPGKGL EwIGYVYxSG NixyNPSL KSRV SMsIdTS ENOESL KLSVTAADTA VYYCARKPYTGGE DYWGQGT LVTSS (SEQ ID NO: 14)

CDR1

CDR2

CDR3

42  
43

**Figure 10**

GTCTCTGTG GCTCCATCAG CAGTGGTGAT TACTACTGGA CCTGATCCG CCAGACACCA GGAAGGCC TGGAGTGAT TGGTACATC TATTACAGTG GGAACACCTA  
CTACAACCCG TCCTCAAGA GTGAGTTTC CATGTCAATA GACACGCTG AGAACAGTT CTCTGAAG CTGAGCTCTG TGACTGCCCG GGACACGCC GTGTATTACT  
GTGAGAGAAA ACCAGTGACT GGGGGGAGAG ACTACTGGGG CCAAGGAACC CTGGTCACCG TCTCTCA (SEQ ID NO: 15)

7

**Figure 11**

TTTCASODISNY LNWYOOK PGKAPK LL LYDASN LETGVPSRFS GSGGTDTETITSS LOPED VGyy VOOYE SLPCGFGQGT KL EIKRTVAAPSV FHPPSDEQ (SEQ ID NO: 16)

CDR1

CDR2

CDR3

44

**Figure 12**

ACCATCACTT GCCAGGCGAG TCAGACATT AGTAACTATT TAAATTGTA TCAGCAGAAA CCAGGAAAG CCTAAGCTCCTGA TCTACGATGC TTCCAATTG GAACAGGGG  
TCCCATCAAG GTTCAGTGGA GTGATCTG GGACA GATTTACTT TCACCATCAG CAGCTGCAG CCTGAAGATG TTGAAACATA TGCTGTGAA CAGTATGAGA GTCTC  
CCGTCCGTT TTGGCAGGG GACCAAACTG GAGATCAAA (SEQ ID NO: 17)

8

**Figure 13**

VSQGSINSGDFFYMSWIROHPKGLIEWIGYVYSGSTYNNPSLKSRTVMsIdPskNOFSKLlSYTAADTAVYVCA<sup>5</sup>TSL<sup>2</sup>YXGGMDVYWGQGTIVVSS (SEQ ID NO: 16)  
 CDR1 CDR2 CDR3

**Figure 14**

GTCCTGCTGTG GCTCCATCAA CAGTGGTGAT TTCTACTGGA GCTGGATCCG CCAACACCCA GGGAAAGGCC TGGAGTGAT TGGGTACATC TATTACAGTGGAGACACCTA  
 CTACAACCCG TCCCTCAAGA GTCCAGTTAC CATGTCAATA GACCCGTCTA AGAACCAAGTT CTCCCTGAAA CTGATCTCTG TGAATGCCCG GGACACGGCC GTTATTACT  
 GTGCGACNTC CCTTACTAT GGGCGGGGTA TGGACGTCCTG GGGCCAAGGG ACCACGCTCA CCGTCTCTC A (SEQ ID NO: 16)

**Figure 15**

TTTCQASQDISNNL<sup>10</sup>nwyooKRGnAPKLLIYDASNL<sup>10</sup>ETGVPSRSGSGSD<sup>10</sup>DFTHISNLOPEDIAITYYCOH<sup>10</sup>VDHLPWTFGQGTIKVEXKRTVAAPSVFIFPPSDEQ (SEQ ID NO: 17)  
 CDR1 CDR2 CDR3

**Figure 16**

ACCATCACTT GCCAGGCGAG TCAGACATT AACAACTATT TGAATTGGTA TCAGCAGAG CCNGGGAACG CCCCT AAACCTCTGA TCTACGATGC ATCCAATTG  
 GAAACAGGGG TCCGATCAAG GTTCAGTGGA AGTGATCTG GGACA GATTTACTT TCACCATCAA CAGCTGCAAG CCTGAAGATA TTGGACATA TTAATGTCAA  
 CACTATGATC ATCTC CCGTGGACGT TCGGCCAAGG GACCAAGGTG GAANTCAAA (SEQ ID NO: 18)

10

**Figure 17**

VSGGSINNDYYWSWROHPKGLFWGHHyySGSTYLSLSKSLTISVDTSKNQFSLKLNsyTAADIAVYYCARGIVLTYXEDYXWGCCTTVTVSS (SEQ ID NO: 47)  
 CDR1 CDR2 CDR3

**Figure 18**

GTCTGTGGTGGCTCCATCAACAATGGTGGAT TACTACTGGA GCTGGATCCG CCAGACACCA GGAAGGGCC TGGAGTGGAT TGGGCACATC TATTACAGTGGAGCACCTA  
 CTACATCCCG TCCCTCAGA GTGGAAGTAC CATATCAGTA GACACGTCTA AGAACCAAGTT CTCCCTGAAG CTGAAGTCTGTGACTGCCCGG GACACGGCC GTGTATTACT  
 GTGGAGAGAG GACAGTAACT ACGTACTACT TTGACTACTG GGGCCAGGGA ACCCTGGTCA CCGTCTCTC A (SEQ ID NO: 48)

**Figure 19**

TTTCRASOSISSYLNWYOOKPKGKAPKLLIYAASSLOSgvPSRESGSGTDELTTSSLOPEDFATYYCOOGYRTPECSFGQGTKLKIRTVAAPSVFIHPPSDEQ (SEQ ID NO: 49)  
 CDR1 CDR2 CDR3

**Figure 20**

ACCATCACTT GCCGGGCAAG TCAGAGCAAT AGCAGCTATT TAAATTGTA TCAGCAGAAA CCAGGGAAG CCCCT AAGCTCCTGA TCTATGCTGC ATCCAGTTTG  
 CAAAGTGGGG TCCCATCAAG GTTCAGTGGC AGTGATCTG GGACA GATTTCATCTC TCACCATCAG CAGTCTGCAA CCTGAAGATT TTGCAACTTA CTACTGTCAA  
 CAGGTTACA GAACC CTTCCGAGT GCAGTTTGG CCAGGGGACC AAGCTGGAGA TCAAA (SEQ ID NO: 50)

**Figure 21**

VS~~GGSVSSG~~DYXWSWIRPQKLEWIGHLYXSGNINYNPSLKSRYTSLDITSKNOISLKLSVTAADTAVYYCAEDELIGSEEDYWGQGITLVTVSS (SEQ ID NO:24)  
CDR1 CDR2 CDR3

**Figure 22**

GTCCTGTGTG GCTCCGTCAG CAGTGTGTAT TACTACTGGA GCTGGATCCG GCAGCCCCA GGAAGGAGAC TGGAGTGGAT TGGACATCTC TATTACAGTG GGAACACCAA  
CTACAAACCCC TCCCTCAAGA GTCGAGTCAC CATATCATTA GACACGTCCA AGAACAGATT CTCCCTGAAG CTGACCTCTG TGACCGCTGC GGACACGGCC GTGTATTACT  
GTGCGAGAGA TTTTITGACT GGTTCCTCTTTGACTACTG GGGCCAGGGA ACCCTGGTCA CCGTCTCTC A (SEQ ID NO:25)

**Figure 23**

TTTCASQDISNYLVNYYOQKFKAPKLLNDASDLEIGVPSRLSGSGGTDETFETISNLQPEDIAITYYCOOYDSLPLTFGGGTVKVEIRTVAAPSVFIRPPSIDEQ (SEQ ID NO:26)  
CDR1 CDR2 CDR3

**Figure 24**

ACCATCACTT GCCAGCGAG TCAGGACATA AGCAACTAAT TAAATTGGTA TCAGCAGAAA CCAGGAAAAG CCCC TAACTCTGA TCAACGATGC ATCCGATTTG  
GAAACAGGGG TCCCATCAAG GATCAGTGA AGTGATCTG GGACA GATTTACTT TCACCATCAG CAACCTGCAG CCTGAGAGATA TTCAACATA TTAATGTCAA  
CAATATGATA GTCTC CCGCTCACTT TCGGCGGAGG GACCAAGGTG GAGATCAGA (SEQ ID NO:27)

(14)

(13)

(49)

(50)

**Figure 25**

VSQGSV YSGDYYXWSW/HOPPGKGLIEWIGYDYSGSTNNPSELKSRVTISVDISKNOFSLKLSVTAADTAVYYCARSLSLQATNYYWGQGLVTYSS  
CDR1 CDR2 CDR3

(SEQ ID NO: 30)

51

**Figure 26**

GTCTCTGGTGGCTCCGCTCTA CAGTGGTGAT TACTACTGGA GCTGGATCCG GCAGCCCCC GGGAGGGGAC TGGAGTGAT TGGGTATATC TATTACAGTG GGAGCACCAA  
TTACAATCCC TCCCTCAAGA GTCGAGTGAC CATATCAGTA GACACGTGCA AGAACAGATT CTCCCTGAAG CTGAGCTCTG TGACCGCTGC GGACACGGCC GTGTATTACT  
GTGCGAGAGA CTCCATACTG GGAGCTACCA ACTACTGGGG CCAGGGAACC CTGGTCACCG TCTCTCA (SEQ ID NO: 31)

**Figure 27**

TTTCASOXISNYLXWYOOKPKKAPKXLSDDASNLHETGVPSRFSGSGGTXXXTITISSLOPEDIATYHCHXOXSILPLTGGGKVEIKRTVAAPSVFIPPSDEQ  
CDR1 CDR2 CDR3

(SEQ ID NO: 32)

52

**Figure 28**

ACCATCACTT GCCAGGGCAG TCNGACATT AATACTATT TANATTGGTN TCAGCAGAAA CCAGGGAAG CCCCT AAATCTCTGA TCTCGATCC ATCCAATTTA  
GAAACAGGGG TCCCATCGAG GTTCAGTGA AGTGATCTG GGACA GANTINTACTT TCACCATCAG CAGCTGCAG CCTGAAGATA TTGCNACATA TCACTGTCNA  
CAGTATNATA GTCTC CCGCTCACTT TCGGGCGAGG GACCAAGTA GAGATCAAA (SEQ ID NO: 33)

116

**Figure 29**

VSGSVSSGDDVYLYROSPGKGLFWIGHYRSGNINYNPSLKSRLTSLDTSKLQPSLKLSVTADTALYYCVKDRVTGAEDWQGTMTSS (SEQ ID NO: 38)

CDR1

CDR2

CDR3

53

**Figure 30**

GTCCTGTGTG GCTCCGTCAG CAGTGTGTAT TACTACTGGA CCTGATCCG GCAGTCCCA GGAAGGAC TGGAGTGGAT TGGACACATC TATTACAGTG GGAACACCAA  
TTATACCCC TCCCTCAAGA GTGACTTCAC CATATCAATT GACACGTCCA AGACTCAGTT CTCCCTGAAG CTGAGTTCTG TGACCGCTGC GGACACGGCC ATTATTACT  
GTGTGCGAGA TCGAGTGACT GGTGCTTTTG ATATCTGGGG CCAAGGACA ATGCTCACCG TCTCTCA (SEQ ID NO: 39)

17

**Figure 31**

TTTCQASODISNXYLNWYQOKPQKAPKLLYDASNLEIGVPSRFSGSGSGTIDFTTISLOPEDIAITYFCQHEDHLPLAFGGGTVKVEIKRTVAAPSVFIKPPSDEQ (SEQ ID NO: 40)

CDR1

CDR2

CDR3

54

**Figure 32**

ACCATCACTT GCCAGGCGAG TCAGGACATC AGCAACTATT TAAATTGTA TCAGCAGAAA CCAGGAAAG CCCCT AAACCTCTGA TCTACGATGC ATCCAATTG  
GAAACAGGGG TCCCATCAAG GTTCAGTGA AGTGATCTG GGACA GATTTTACTT TCACCATCAG CAGCTGCAG CCTGAAGATA TTGCAACATA TTTCGTGCAA CACTTTGATC  
ATCTC CCGCTCGCTT TCGGCGGAGG GACCAAGGTG GAATCAAA (SEQ ID NO: 41)

18



10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
GCGATCCAGC	CTTTTAGGTC	CATGCCNTTC	TCTGIGNAG	CGTCTGGATT	50
A I Q P	F R S	M P F	S C X A	S G F	
CCCCITCAGT	AGNINIGGCA	TGCACTGGGT	CCGCCAGGCT	CCAGGCAAGG	100
P F S	X X G M	H W V	R Q A	P G K G	
GGCTGGAGTG	GGTGGCAGTT	ATATGGTATG	ATGGAAGTAA	TAAATACTAT	150
L E W	V A V	I W Y D	G S N	K Y Y	
GCAGACTCCG	TGAAGGGCCG	ATTCAACATC	TCCAGAGACA	ATTCCAAGAA	200
A D S V	K G R	F T I	S R D N	S K N	
CACGCTGAT	CTGCAATGA	ACAGACTGAG	AGCCGAGGAC	ACGGCTGTGT	250
T L Y	L Q M N	R L R	A E D	T A V Y	
ATTACTGIGC	GACATTTTC	<del>GAGTCCCTTTC</del>	<del>CCATTCAGTAA</del>	<del>CCGCTCCG</del>	300
Y C A	R F L	E W L P	F D Y	W G Q	
<del>CCATCCCTTTC</del>	<del>ATAGGGTAT</del>	<del>CTCC</del>	ACCAAGGGCC	CATCGGICTT	350
G T L V	T V X	S D S	T K G P	S V F	
CNCCCTGGCG	CCCTGCTTCC	AGGAGCACCC	TGNGANAGCA	CANANGGCCC	400
X L A	P C F Q	E H P	X X A	X X A P	
CTGGGACTGN	CTGNITACAAG	GACINCTTTC	CCTCNAACCN	GGTGACCNIN	450
G T X	X Y K	D X F P	S N X	V T X	
TCNIGGGAAA	CTCAGNGCNC	NICINNATNA	C		481
S W E T	Q X X	S X X			

(SEQ ID NO: 19)  
(SEQ ID NO: 55)

20.1 heavy

10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
GGAACCTTIN	GGTTCGCNCC	TTTTGGAGNC	AGACCCANCA	TCACTTGTCTG	50
G T F X	F A P	F G X	R P X I	T C R	
GGCGAGTCAG	GGCATTAGCA	ATTTTTTAGC	CTGGTTTCAG	CAGAAACCAG	100
A S Q	G I S N	F L A	W F Q	Q K P G	
GGATAGCCCC	TAAGTCCCTG	ATCTATGCTG	CATCCACTTT	GCAAAGTGGG	150
I A P	K S L	I Y A A	S T L	Q S G	
GICCCATCAA	AGTTCACCGG	CAGTGGATAT	GGACAGATT	TCACTCTCAC	200
V P S K	F T G	S G Y	G T D F	T L T	
CATCAGCAGC	CTGCAGCCTG	AAGACTTTGC	AACTTATTAT	TGICAAACAAT	250
I S S	L Q P E	D F A	T Y Y	C Q Q Y	
ATAATGTTTA	CCATTCACT	TTCGGCCCTG	GGACCAAAGT	GGATATCAAA	300
N V Y	P F T	F G P G	T K V	D I K	
CGAACTGTGG	CTGCACCATC	TGTCCTTCATC	TTCGCGCCAT	CTGATGAGCC	350
R T V A	A P S	V F I	F P P S	D E P	
AGTTGAAATC	TGGAAGTGGC	TCTGTGTGTG	GCCTGCTGAA	TAACTTCTAT	400
V E I	W N C L	C C V	P A E	. L L S	
CCCAGAGAGG	CCAAAGTACA	GIGGAAGGTG	GATAACGCCN	CNNTTGGCGG	450
Q R G	Q S T	V E G G	. R X	X W R	
NNICCTTTTIN	CTCNCCCNIC	CTCNCCCNIC	CTCTCNCA	(SEQ ID NO: 20) 489	
X P F X	X P S	S X X	L S X	(SEQ ID NO: 56)	

20.1 Kupper

10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
AAGCCTGTIG	CCTCAGTGCA	GGICTCCTGC	AAGGCTTCTG	GATACACCTT	50
K P V A	S V Q	V S C	K A S G	Y T F	
CACCAGTTAT	GATATCAACT	GGGTGCGACA	GGCCACTGGA	CAAGGGCTTG	100
T S Y	D I N W	V R Q	A T G	Q G L E	
AGTGGATGGG	ATGGATGAAC	CCTAACAGTG	GTAACACAGG	CTATGCACAG	150
W M G	W M N	P N S G	N T G	Y A Q	
AAGTTCAGG	GCAGAGTCAC	CATGACCAGG	AACACCTCCA	TAAGCACAGC	200
K F Q G	R V T	M T R	N T S I	S T A	
CTACATGGAG	CTGAGCAGCC	TGAGATCTGA	GGACACGGCC	GTTATTACT	250
Y M E	L S S L	R S E	D T A	V Y Y C	
GTCGAGAGG	AGGCCCCAT	AGCAGTGGCT	GGACCTTCTT	TGACTACTGG	300
A R G	G P Y	S S G W	T F F	D Y W	
GGCCAGGGAA	CCCTGGTCAC	CGICTCCTCA	GCCCTTCACC	AAGGGCCCAT	350
G Q G T	L V T	V S S	A L H Q	G P I	
CGGICTTCCC	CCTGGCGCCC	TGCTCCAGGA	GCACCTCCCA	GAGCACANTC	400
G L P	P G A L	L Q E	H L P	E H X X	
NNCCCTGGG	CTGCCTGGNN	CAAGGACTCT	TTCCCCNAAC	CCCGGNTGA	449 (SEQ ID NO: 21)
P L G	C L X	Q G L F	P X T	P X	(SEQ ID NO: 57)

DNI

20.3 heavy

10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
TTTGAACCCCT TCTNIGGCCGT GTCTCTINGGC GCGAGGGCCA CCATCAACTG					50
F E P F X A V S L G A R A T I N C					
CAAGTCCAGC CAGCGTGTTC TATACANCTC CAACAATAAG AACTGCTTAG					100
K S S Q R V L Y X S N N K N C L A					
CTTGGTACCA GCAGAAACCA GGACAGCCTC CTAAGCTGCT CATTACTGG					150
W Y Q Q K P G Q P P K L L I Y W					
ACATCTACCC GCGAATCCGG GTTCCCTGCC CGATTGAGTG GCAGCGGGTC					200
T S T R E S G V P A R F S G S G S					
TGGGACAGAT TTTACTCTCA CCATCAGCAG CCTGCAGGCT GAAGATGTGG					250
G T D F T L T I S S L Q A E D V A					
CAGTTTATTA CTGTACAGCA TATTATAGTA CTCCACTCAC TTTCCGGCGA					300
V Y Y C Q Q Y Y S T P L T F G G					
GGGACCATGG TGGAGATCAA GCGAAGTGTG GCTGCACCAT CTGTCTTCAT					350
G T M V E I K R T V A A P S V F I					
CTTCCCGCCA TCTGATGAGC CNGTINIGAAA TCTGGAACTG CCTCTGTTTG					400
F P P S D E P V . N L E L P L F V					
TGTTCCCTGC TGAATAACTT CTATCCCGA GAGGCCAAAG TACCAGTGA					450
C P A E . L L S Q R G Q S T S G					
AGGTGCATAA (SEQ ID NO: 22)					460
R W I (SEQ ID NO: 58)					

*20.3 Kappen*

10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
CNGCCTGTTA	GGTCCNIGCG	ACTCTCCTGT	GCAGCGICTG	GATTCATCTT	50
X P V R	S X R	L S C	A A S G	F I F	
CAGTACNTAT	GGCATGCACT	GGGTCCGCCA	GGCTCCAGGC	AAGGGGCTGG	100
S X Y	G M H W	V R Q	A P G	K G L E	
AGTGGGIGGC	AATTATATGG	TATGATGGAA	GTAATAAATA	CTATGCAGAC	150
W V A	I I W	Y D G S	N K Y	Y A D	
TCCGTGAAGG	GCCGATTAC	CATCTCCAGA	GACAATTCCA	AGAACAGGCT	200
S V K G	R F T	I S R	D N S K	N T L	
GTATCTGCAA	ATGAACAGCC	TGAGAGCCGA	GGACACGGCT	GIGTATTACT	250
Y L Q	M N S L	R A E	D T A	V Y Y C	
GTCGAGAGA	CGGGGGGCCA	<u>CGGTGGTTTC</u>	TGCCTTCTGA	CTACTGGGGC	300
A R D	G G P	R W F L	A S D	Y W G	
CAGGGAACCC	TGGTACCGT	CTCCTCAGCC	TCCACCAAGG	GCCCATCGGT	350
Q G T L	V T V	S S A	S T K G	P S V	
CTTCCCCCTG	GCGCCCTGCT	CCAGGAGCAC	CCTTCGAGAG	CACAGCGGCC	400
F P L	A P C S	R S T	L R E	H S G P	
CTGGGCTGCC	TGGTCAAGG	ACTACTTTCC	CCGAACCGGT	GACGGTGINC	450
G L P	G S R	T T F P	E P V	T V X	
GTGGAACTC	ATGAC	(SEQ ID NO: 23)			465
V G T H	D	(SEQ ID NO: 59)			

20.8.1 copy

10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
AGTCTCCAGA	CTCCCTGGTT	GIGICTCTGG	GCGAGAGGCC	CACCATCAAC	50
S L Q T	P W L	C L W	A R G P	P S T	
TGCAAGTCCA	GNCAGAGTAT	TTTATACAGC	TCCAACAATC	AAAAACTTCT	100
A S P	X R V F	Y T A	P T I	K N F L	
TAGCTTGGTA	CCAGCAGAAA	CCAGGACAGC	CTCCGAAGTT	GCTCATTTAC	150
A W Y	Q Q K	P G Q P	P K L	L I Y	
TGGGCATCTA	TTCCGGGAATC	CGGGGTCCCT	GACCGATTCA	GIGGCAGCGG	200
W A S I	R E S	G V P	D R F S	G S G	
GTCTGGGACA	GATTTCACTC	TCACCATCAG	CAGCCTGCAG	GCTGAAGATG	250
S G T	D F T L	T I S	S L Q	A E D V	
TGGCAGTTTA	TTACTGTTCAG	CAGTATTATA	GIATTCGGTG	CACTTTGGCC	300
A V Y	Y C Q	Q Y Y S	I P C	T F G	
CAGGGGACCA	AGCTGGAGAT	CAAACGAACT	GIGGCTGCAC	CATCTGICTT	350
Q G T K	L E I	K R T	V A A P	S V F	
CATCTTCCCG	CCATCTGATG	AGCAGTTGAA	ATCTGGAACT	GCCTCTGTG	400
I F P	P S D E	Q L K	S G T	A S V V	
TGIGCCTGCT	GAATAACTTC	TATCCCAGAA	AGGCCAAAGT	ACATGAAGGG	450
C L L	N N F	Y P R K	A K V	H E G	
TTCAAA	(SEQ ID NO: 24)				456
F K	(SEQ ID NO: 60)				

20.8.1 Kupper

10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
GGCGTGGYCC	AGCCTGKAG	GTCCTGAGA	CTCTCCTGIG	CAGCGTCTGG	50
G V X Q	P X R	S L R	L S C A	A S G	
ATTCAYCTTC	AGTARCTATG	GCATGCACTG	GGTCCGCCAG	GCTCCAGGCA	100
F X F	S X Y G	M H W	V R Q	A P G K	
AGGGGCTGGA	GTGGGTGGCA	ATTATATGGT	ATGATGGAAG	TAGCAAATAC	150
G L E	W V A	I I W Y	D G S	S K Y	
TATGCAGACT	CCGIGAAGGG	CCGATTCACC	ATCTCCAGAG	ACAATTCCAA	200
Y A D S	V K G	R F T	I S R D	N S K	
GAACACGCTG	TATCTGCAAA	TGAACAGCCT	GAGAGCCGAG	GACACGGCTG	250
N T L	Y L Q M	N S L	R A E	D T A V	
TGTATTACTG	TGCGAGAGAC	GGGGGGCCAC	GGTGGTTTCT	CGCTTCTGAC	300
Y Y C	A R D	G G P R	W F L	A S D	
TACTGGGGCC	AGGGAACCT	GGTCACCGTC	TCTCAGCCT	CCACCAAGGG	350
Y W G Q	G T L	V T V	S S A S	T K G	
CCCATCGGTC	TTCCCCCTGG	CGCCCTGCTC	CAGGAGCACC	TTCCGAGAGC	400
P S V	F P L A	P C S	R S T	F R E H	
ACAGCGGCCC	TGGGCTGCCT	GGTCAAGGAC	TACTTCCCCG	AAMCGGTGAC	450
S G P	G L P	G Q G L	L P R	X G D	
GGTGTCTGG	AATCAGGCG	CTCTGACCAG	NGGCGTGCAC	AATTCACAGC	500
G V V E	L R R	S D Q	X R A Q	F P A	
NGTCTINAAG	GTTGAAATCG	TAANGGTTCA	AA	(SEQ ID NO: 25)	532
V L K	V E I V	X V Q		(SEQ ID NO: 61)	

20.11.2. heavy

10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
ACTCAGTCTC	CAGACTCCCT	GGCTGTGTCT	CTGGGCGAGA	GGGCCACCAT	50
T Q S P	D S L	A V S	L G E R	A T I	
CAACTGCAAG	TCCAGCCAGA	GTGTTTTATA	CGGCTCCAAG	AATCAGAACT	100
N C K	S S Q S	V L Y	G S K	N Q N Y	
ACTTAGCTTG	GTACCAGCAG	AAACCAGGAC	AGCCTCCTAA	GCTGCTCATT	150
L A W	Y Q Q	K P G Q	P P K	L L I	
TACTGGGCAT	CTACCCGGGA	ATCCGGGGTC	CCTGACCGAT	TCAGGGGCAG	200
Y W A S	T R E	S G V	P D R F	R G S	
CGGGICTAGG	ACAGATTICA	CTCTCACCAT	CAGCAGCCTG	CAGGCTGAAG	250
G S R	T D F T	L T I	S S L	Q A E D	
ATGTGGCAGT	TTACTTCTGT	CACCAATATT	ATAGTACTOC	GTTGGACGTT	300
V A V	Y F C	H Q Y Y	S T P	W T F	
GGCCAAGGGA	CCAAGGTGGA	AATCAAACGA	ACTGTGGCTG	CACCATCTGT	350
G Q G T	K V E	I K R	T V A A	P S V	
CTTCATCTTC	CCGCCATCTG	ATGAGCAGTT	GAAATCTGGA	ACTGCCCTCTG	400
F I F	P P S D	E Q L	K S G	T A S V	
TTGTGTGCCT	GCTGAATAAC	TTGTATCCCA	GAAAGCCAAG	GACACGAAAG	450
V C L	L N N	L Y P R	K P R	T R K	
GTCANACCNA	CCC	(SEQ ID NO: 26)			463
V X P T		(SEQ ID NO: 62)			

20.11.2 Kappa



10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
CGIGATCCNC	CTGGENIGGIC	CCTGAGACTC	TCCTGTGCAG	CGTCTGGATT	50
R D P P	G W S	L R L	S C A A	S G F	
CATCTTCANT	AACIATINCA	TGCACTGGGT	CCGCCAGGCT	CCAGGCAAGG	100
I F X	N Y X M	H W V	R Q A	P G K G	
GGCTGGAGTG	GGTGGCAATT	ATATGGTATG	ATGGAAGTAG	CAAATACTAT	150
L E W	V A I	I W Y D	G S S	K Y Y	
GCAGACTCCG	NGAAGGGCCG	ATTCACCATC	TCCAGAGACA	ATTCCAAGAA	200
A D S X	K G R	F T I	S R D N	S K N	
CACGCTGTAT	CTGCAAATGA	ACAGCCTGAG	AGCCGAGGAC	ACGGCTGATG	250
T L Y	L Q M N	S L R	A E D	T A D V	
TATTACTGIG	CGAGAGACCG	TTGGGCCACG	GTTGGCTTCTC	GCTTCTGACT	300
L L C	E R R	L G H G	G F S	L L T	
ACTGGNGCNC	AGGGCAACNC	TGNCINACCG	TNTTCCTCAN	CCCTINTACNC	350
T G A Q	G N X	X X P	X S S X	L Y X	
AAGGGCCNCC	ATTNGGTCTT	TCCCCCCTGG	NNNNCCTGCT	CNATGNNNCA	400
R A X	I X S F	P P G	X P A	X X X T	
CCCTINCGACA	NCNACAN	(SEQ ID NO: 27)			417
L R X	X X	(SEQ ID NO: 63)			

2018 heavy

10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
TTCGTTGGCTG TGTCTCTTGG CGAGAGGNCC ACCATCAACT GCAAGTCCAG					50
F V A V S L G E R X T I N C K S S					
CCAGAGTATT TTATACAGCT CCAACAATCA AAACCTTCTTA GCTTGGTACC					100
Q S I L Y S S N N Q N F L A W Y Q					
AGCAGAAACC AGGACAGCCT CCGAAGTTGC TCATTTACTG GGCATCTATT					150
Q K P G Q P P K L L I Y W A S I					
CGGGAATCCG GGGTCCCTGA CCGATTTCAGT GGCAGCGGGT CTGGGACAGA					200
R E S G V P D R F S G S G S G T D					
TTTCACTCTC ACCATCAGCA GCTTGCAGGC TGAAGATGTG GCAGTTTATT					250
F T L T I S S L Q A E D V A V Y Y					
ACTGTCAGCA GTATTATAGT ATTCCGTTGCA CTTTITGGCCA GGGGACCAAG					300
C Q Q Y Y S I P C T F G Q G T K					
CTGGAGATCA AACGAACCTGT GGCTGCACCA TCIGTCTTCA TCTTCCCGCC					350
L E I K R T V A A P S V F I F P P					
ATCTGATGAG CCAAGNITGA AAATCTGGAA CTGCCTCTGT TGIGTGGCCT					400
S D E P X L K I W N C L C C V P C					
GCTTGAATAA CTTCTATCCC AGAGANGGCC AAAGTCCNGT GGAAGGTGGA					450
L N N F Y P R X G Q S P V E G G					
TAC	(SEQ ID NO: 28)				453
Y	(SEQ ID NO: 64)				

20.18 kypen

10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
CTCACCTGCA	CTGTCTCTGG	TGGCTCCATC	AGTAGTTACT	NTTGGAGNTG	50
L T C T	V S G	G S I	S S Y X	W X W	
GATCCGGCAG	CCCGNAGGGA	AGGGACTGGA	GTCGATTGGG	TGTTTCTATT	100
I R Q	P X G K	G L E	W I G	C F Y Y	
ACAGNCGGAG	CACCAACTAC	AACCCCTCCC	TNAAGAGTCA	TGTCACCATA	150
X G S	T N Y	N P S L	K S H	V T I	
TCAGTAGACA	CGTCCAAGAA	CCAGTTCTAC	NIGAAGCTGA	GCINTGIGAC	200
S V D T	S K N	Q F Y	X K L S	X V T	
CGNTGCCGAC	ACGGNCGNGA	ATAACTGNGC	NAGAGATAGG	GGAGNAGTGN	250
X A D	T X X N	N X A	R D R	G X V X	
NNTGGCNINC	TACTINTGACT	ACTGAGGCCA	GNGAACCNTG	GNTCACAGTA	300
W X X	T X T	T E A X	E P W	X T V	
ATCCNTAAGN	CTNNCAANCA	AANGNENCCC	AANGNGANAC	NINNCININC	350 (SEQ ID NO: 29)
I X K X	X X Q	X X P	X X X X	X X	(SEQ ID NO: 65)

20.19.2 heavy

10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
TCTTTGGTAG	CGNGTCTTGG	CGAGAGGCC	ACCATCAACT	GCAAGTCCAG	50
S L V A	X L G	E R P	T I N C	K S S	
CCAGAGTGT	TTATACNGCT	CCAAGAATCA	GAAGTACTTA	GCTTGGTACC	100
Q S V	L Y X S	K N Q	N Y L	A W Y Q	
AGCAGAAACC	AGGACAGCCT	CCTAAGCTGC	TCATTIACCTG	GGCATCTACC	150
Q K P	G Q P	P K L L	I Y W	A S T	
CGGGAATCCG	GGGTCCCTGA	CCGATTTCAGG	GGCAGCGGGT	CTAGGACAGA	200
R E S G	V P D	R F R	G S G S	R T D	
TTTCACTCTC	ACCATCAGCA	GCCTGCAGGC	TGAAGATGTG	GCAGTTTACT	250
F T L	T I S S	L Q A	E D V	A V Y F	
TCTGTCACCA	ATATTATAGT	ACTCCGIGGA	CGTTCGGCCA	AGGGACCAAG	300
C H Q	Y Y S	T P W T	F G Q	G T K	
GTGGAATCA	AACGAAGTGT	GGCTGCACCA	TCTGTCTTCA	TCTTCCCGCC	350
V E I K	R T V	A A P	S V F I	F P P	
ATCTGATGAG	CACCTTGAAA	TTCTGGAACT	GCCTCTGNTG	NGTGCCTGCT	400
S D E	H L E I	L E L	P L X	X A C .	
GAACNAACTC	TATCCCCAGA	GANGGCCCAA	AAGINTCAAG	NINGNNAGGC	450
T N S	I P R	X G P K	V S X	X X G	
NINGATAACGC	CINTTNCN	NCNINC	(SEQ ID NO: 30)		476
X I T P	X X X	X	(SEQ ID NO: 66)		

20.19.2 Kappa

10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
AAGCCTTTTC	AGACCNIGCC	CTTCACCTGC	ACTGTCCTCTG	GTTGGCTCCAT	50
K P F Q	T X P	F T C	T V S G	G S I	
CAGCAGTGGT	GGTTACTACT	GGAGCTGGAT	CCGCCAGCAC	CCAGGGAAGG	100
S S G	G Y Y W	S W I	R Q H	P G K G	
GCCTGGAGTG	GATTGGGTAC	ATCTATAACA	GTTGGGAGCAC	CTACTACAAC	150
L E W	I G Y	I Y N S	G S T	Y Y N	
CCGTCCCTCC	AGAGTCGAGT	TACCATATCA	GTAGACACGT	CTAAGAACCA	200
P S L Q	S R V	T I S	V D T S	K N Q	
GTTCCTCCCTG	AAGCTGAGCT	CTGTGACTGC	CCGGGACACG	GCCGTGTATT	250
F S L	K L S S	V T A	A D T	A V Y Y	
ACTGTGCGGG	<u>TCAGAAATGG</u>	TCCTACTACT	ACTACTACGG	TATGGACGTC	300
C A G	Q K W	S Y Y Y	Y Y G	M D V	
TGGGGCCAAG	GGACCACGGT	CACCGTCTCC	TNAGCCTCCA	CCAANGGCCC	350
W G Q G	T T V	T V S	X A S T	X G P	
ATCGGTCTTC	CCCCTGGGCG	CCTGNTCTAG	GAGCACCTCC	CANAGCACAG	400
S V F	P L A P	X S R	S T S	X S T D	
ACGGATNCTG	GGCCTGCCTG	NATCAATGGA	CTACTTTCCC	CGAACCGGTT	450
G X W	A C L	X Q W T	T F P	E P V	
GNNIGTGNNN	CCTGGNAACT	N	(SEQ ID NO: 31)		471
X C X X	W X L		(SEQ ID NO: 67)		

20.21 heavy

Fig. 70

10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
AAGCCTTTTG	AGACCNFGCC	CCTCACCTGC	ACTGTCTCTG	GTTGGCTCCAT	50
K P X E	T X P	L T C	T V S G	G S I	
CAGTAATTAC	TACTGGAGCT	GGATCCGGCA	GCCCCCAGGG	AAGGGACTGG	100
S N Y	Y W S W	I R Q	P P G	K G L E	
AGTGGATTGG	GTATATCTAT	TACAGTGGGA	GCACCAACTA	CAACCCCTCC	150
W I G	Y I Y	Y S G S	T N Y	N P S	
CTCAAGAGTC	GAGTCACCAT	ATCAGTAGAC	ACGTCCAAGA	ACCAGTCTTC	200
L K S R	V T I	S V D	T S K N	Q F S	
CCIGAAGCTG	AGCTCTGTGA	CCGCTGCGGA	CACGGCCGTG	TATTACTGTG	250
L K L	S S V T	A A D	T A V	Y Y C A	
CGAGAGGGCC	CGGGGGGAGC	TACTACTACT	ACGGTATGGA	CGTCTGGGGC	300
R G P	G G S	Y Y Y Y	G M D	V W G	
CAAGGGACCA	CGGTACCGT	CTCCTCAGCC	TCCACCAAGG	GCCCATCGGT	350
Q G T T	V T V	S S A	S T K G	P S V	
CTTCCCCCTG	GCGCCCTGCT	CCAGGAGCAC	CTCCGAGAGC	ACAGCGGCCC	400
F P L	A P C S	R S T	S E S	T A A L	
TGGGCTGCCT	GGGICAAGGA	CTACTTCCCC	GAACCGGTGA	CGGTGTTCGN	450
G C L	G Q G	L L P R	T G D	G V R	
NGGAAC	(SEQ ID NO: 32)				456
X N	(SEQ ID NO: 68)				

20.22 heavy

## E7.5.2.K.aa Sequence

Figure 72

10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
CTGTCIGCAT	CTGTAGGAGA	CAGAGTCATA	ATCACTTGCC	GGGCAAGTCA	50
L S A S	V G D	R V I	I T C R	A S Q	
AAACATCACC	GACCATTTAA	ATTGGTATCA	GCAGATAGCA	GGAAAAGCCC	100
N I T	D H L N	W Y Q	Q I A	G K A P	
CTAGGCCCCCT	GATATACACT	GCATCCAGTT	TGCAAGGTGG	GGTCCCATCA	150
R P L	I Y T	A S S L	Q G G	V P S	
AGGTTGAGTG	GCAGTGGATC	TGGGACAGAT	TTCACTCTCA	CCATCAGCAG	200
R F S G	S G S	G T D	F T L T	I S S	
TCTGCAACCT	GAAGATTTTT	CAACTTACTA	CTGTCAACAG	AGTTACAGTA	250
L Q P	E D F S	T Y Y	C Q Q	S Y S T	
CCCCGTGCAG	TTTGGGCCAG	GGGACCAAGC	TGGAGATCAA	ACGAACTGTG	300
P C S	F G Q	G T K L	E I K	R T V	
GCTGCACCAT	CTGICTTCAT	CTTCCCGCCA	TCTGATGAGC	AGTTGAAATC	350
A A P S	V F I	F P P	S D E Q	L K S	
TGGAAC TGCC	TCTGTTGTGT	GCCTGCTGAA	TAACTTCTAT	CCCA	394 (SEQ ID NO: 33)
G T A	S V V C	L L N	N F Y	P	(SEQ ID NO: 69)

7.5.2 heavy

10	20	30	40	50	
1234567890	1234567890	1234567890	1234567890	1234567890	
GIGAAGGICT	CCTGCAAGGC	TTCTGGATAC	ACCTTCAGCG	GCTACTATAT	50
V K V S	C K A	S G Y	T F S G	Y Y M	
GCACTGGGTG	CGACAGGCC	CTGGACAAGG	GCTTGAGTGG	ATGGGATCGA	100
H W V	R Q A P	G Q G	L E W	M G S I	
TCCACCCCTAA	CAGTGGTGGC	ANAAACTTTG	CACAGAAGTT	TCAGGGCAGG	150
H P N	S G G	X N F A	Q K F	Q G R	
GTCACCATGA	CCAGGGACAC	GTCCATCAAC	ACAGCCTACT	TGGAGCTGAG	200
V T M T	R D T	S I N	T A Y L	E L S	
CAGGCTGAGA	TCTGACGACA	CGGCCGTGTA	TTACTGTGCG	AGAGATAAAA	250
R L R	S D D T	A V Y	Y C A	R D K N	
ACTACGGTGA	CTACGTCTTT	GACTATTGGG	GCCAGGGAAC	CCTGGTCACC	300
Y G D	Y V F	D Y W G	Q G T	L V T	
GTCCTCTCAG	(SEQ ID NO: 34)				310
V S S	(SEQ ID NO: 70)				

7.5.2kappa